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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/476,961	01/03/2000	BIN YU	39153/223-(E	8541

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EXAMINER
WARREN, MATTHEW E

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 04/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/476,961	YU, BIN
	Examiner	Art Unit
	Matthew E. Warren	2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

This Office Action is in response to the Amendment filed on December 13, 2001.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 18-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadosh et al. (US 5,677,224).

Kadosh et al shows (fig. 1U) a semiconductor device including a plurality of field effect transistors, each transistor comprising a gate (130) over a channel and a deep source (206) and drain (198) region doped with dopants of a first conductivity type (P). Source (204) and drain (152) extension regions are integral with the deep source and drain regions respectively. The source extension is more heavily doped (P+) than the drain extension (P-). Kadosh shows all of the elements of the claims except the drain extension being deeper than the source extension. Kadosh does disclose that the source extension is deeper than the drain extension such that the device has a low source-drain series resistance and reduced hot carrier effects. It is well known in the art that a source and drain are identical structures in the device and are only designated by the term "source and drain" to distinguish how the circuit is biased, in which case a source and drain are interchangeable[see Liu et al. (US 6,218,276 B1) in col. 4, lines

29-30]. Therefore it would have been an obvious modification to one of ordinary skill in the art to form the drain extension deeper than the source extension to lower the drain-source series resistance since a drain and source are made of the same materials and only differ because of biasing of the circuit. With respect to the limitations of the claims concerning the specific depth and concentration of the dopants, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the dopants at a specific depth and concentration, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to the limitations concerning the formation of the device in claims 21-35, a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17**(footnote 3). See also in re Brown, **173 USPQ 685**: In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**: In re Avery, **186 USPQ 116** in re Wertheim, **191 USPQ 90** (**209 USPQ 254** does not deal with this issue); and In re Marosi et al, **218 USPQ 289** final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above case law makes clear. "Even though product-by- process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the

claim is unpatentable even though the prior product is made by a different process." In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

Response to Arguments

Applicant's arguments filed with respect to claims 18-37 have been fully considered but they are not persuasive. The applicant primarily asserts that the source and drain are not interchangeable and therefore because Kadosh only discloses that the source extension is deeper than the drain region, the instant invention is patentable. The applicant then sites IEEE dictionary explanations that state that a source and drain are distinct structures. The examiner does not deny that the **function** of a source differs from the **function** of a drain, but still contends that because a source is structurally the same as a drain, any such structure, which is formed by implanted dopants in a substrate on opposing sides of a gate and having a channel in between them, can be **designated** as either a source or drain. To designate those implanted regions, one of ordinary skill in the art , would bias the source to have a positive potential thereby being "less attractive" for the carriers in the channel and would bias the drain to have a negative potential, thereby being "more attractive" for those same carriers. Because such designation is a mere modification of the cited art, the claims are not patentably distinct. Distinction in this case relies on "structural" differences in the semiconductor devices. Because a source and drain are "structurally" the same, there is no distinction in making one designated impurity region different in depth than the other. The cited art teaches an asymmetrical device in which one impurity region has a different depth than

the other. Furthermore, that cited art forms such region in that configuration to solve the same problems associated with the claimed invention. Applicant has not discovered anything new because Kadosh has shown that asymmetrical source and drain regions solve hot carrier problems in semiconductors just as the applicant has also solved those same problems with an asymmetrical source/drain configuration. Finally, Liu et al. (US 6,218,276 B1) in col. 4, lines 29-30 states that the terms source and drain are relative terms therefore making those regions interchangeable. For these reasons, the rejection of the claims still stands and this Action is made **final**.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Warren whose telephone number is (703)

305-0760. The examiner can normally be reached on Mon-Thurs, and alternating Fri, 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

MEW
April 20, 2002

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800